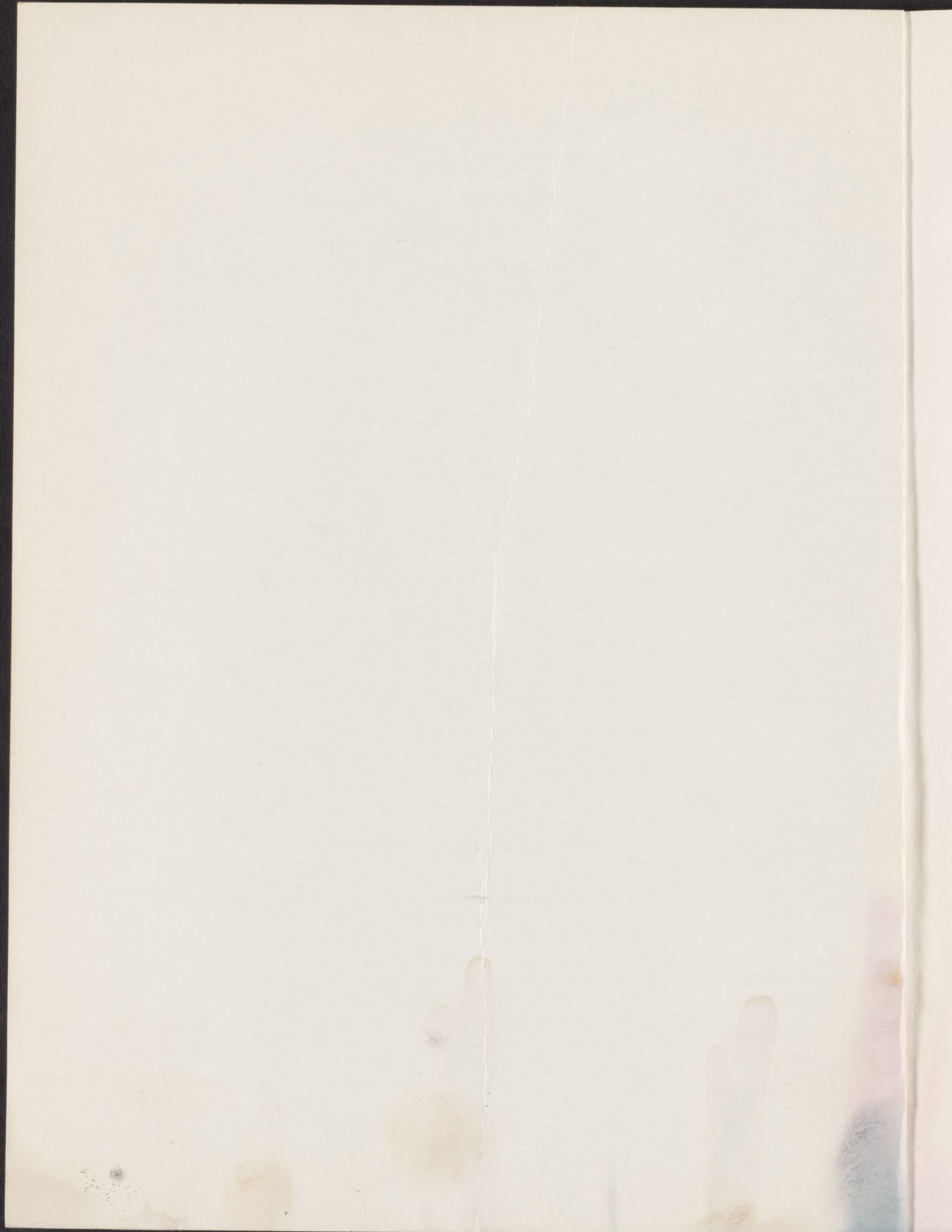


STATE OF CALIFORNIA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF FORESTRY

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Bill Zett.
Frank
Willard
Paulson



the State Forester's 1959 REPORT



Governor
Edmund G. Brown

Director of Natural
Resources
DeWitt Nelson

1959
ANNUAL REPORT
of the
CALIFORNIA DIVISION OF FORESTRY

F. H. Raymond
State Forester

The State Board of Forestry

E. Domingo Hardison, Chairman
Santa Paula

John Baumgartner, Jr.
San Martin

W. B. Carter
Lancaster

Kelly McGuire
Ft. Bragg

E. P. Ivory
Visalia

J. J. Prendergast
Redlands

Kenneth R. Walker
Atherton

1870-1871

1870-1871

1870-1871

1870-1871

COVER PHOTO by Lawrence L. Mansperger
Puerta La Cruz Conservation Camp, San Diego Co.

The Board of Forestry

The State Board of Forestry held eight regular meetings during 1959 where a great deal of routine business was conducted. The term of Wendell T. Robie had expired at the beginning of the year and on April 15, E. P. Ivory of Dinuba arrived to replace him as a representative of forest land ownership. E. Domingo Hardison, longtime member representing agriculture, a resident of Santa Paula, was selected as chairman of the Board. The term of Russell H. Ells, representing the redwood industry, also expired. His successor was not seated until September 15. This was Kelly B. McGuire, an experienced redwood lumberman of Fort Bragg.

By Board resolution Mr. McGuire was selected as its representative on the timber maturity boards of the counties of Humboldt and Mendocino. Constitutional law provides that such boards shall determine the time when a property tax upon growing timber may be levied.

In September the Board toured Mountain Home State Forest. There the William S. Rosecrans Grove was selected and designated by the Board to honor its recent chairman of 14 years duration as an act of appreciation for his nationally recognized service in the field of wild land conservation.

Legislation

There was no unusual new State legislation enacted during 1959 although there were several important refinements of existing law.

Authority by which County Supervisors may make work contracts with the Federal and State governments for the use of county jail prisoners to perform fire prevention and suppression labor was established.

The intent of the Legislature in endorsing conservation camps of State prisoners and youthful wards was very clearly set forth, including the granting of authority to the State Forester to use camp workers under his supervision for conservation type work conducted by other public agencies.

The State Forester was granted authority to vest peace officer authority in U. S. Forest Service personnel acting as State firewardens.

The 1923 County Fire Protection District Act was amended to prohibit the inclusion hereafter within such districts of commercial timber land which is designated by the State Board of Forestry as State Responsibility lands in respect to forest fire protection.

In Ventura County an ordinance was enacted which requires that subdivision properties be cleaned up and the natural fire hazard reduced.

Los Angeles County provided that the Forester and Firewarden shall have a voice in the approval of mountain and foothill real estate subdivisions in respect to such fire control measures as road widths, escape roads and water line installations. Also in Los Angeles an ordinance was adopted by which there may be established zones within the National Forest in which future residential settlement is forbidden. This same reservation of wild land may be extended to include some areas of privately owned land.

In San Mateo County it is necessary that permits to burn be obtained throughout the entire year, especially as a measure to help reduce the smog nuisance.

The 1959 Fire Season

California weather during 1959 in total was extremely "bad" as viewed by firefighters. Three regular and four temporary employees of the Division lost their lives in fires or in fire control action. Three were lost in aircraft wrecks. The peculiarity of weather (or more precisely our present ignorance of local weather behavior) is undoubtedly the strongest contributing cause of these tragedies.

For his valiant but vain attempt to save the life of Foreman Leo L. Boyd after both had been seriously burned, Firefighter Thomas J. Kennelly received the State Medal of Valor. That rare citation is authorized by act of the Legislature.

In addition to these seven dead, the U. S. Forest Service in California reports the loss of 10 men in forest fire action during 1959.

Two favorable conditions may be reported in respect to 1959 fire weather. Lightning strikes were somewhat less than average, and totaled only about 20 percent of the record number suffered the previous year. There were periods of cool weather in August and September, including some rain in the latter month. This was most fortunate because the winter of 1958-59 was extremely dry statewide. Southern California rainfall records were about the lowest known.

March and April weather worsened the situation with warm days and much dry wind. The stage was set for wildfire catastrophe in California. Much to the credit of news dispensing agencies, the repeated fire warnings of the State Forester and other forestry officials were forcefully brought to public attention.

After the September lull the weather became warm, windy and dry again. By official proclamation the Director of Natural Resources

declared that no burning or blasting could be done after December 1st (during the usual "non-permit" season) except under permit granted by the State Forester's agents.

National Forests in the Sierra Nevada suffered cruel fire losses during the high winds of late fall. Statistics are witness to the fact that the Division of Forestry forces enjoyed a most creditable record during this season of such potential hazard. With considerable justification it may be claimed that a sufficient number of trained crews, adequately manned and equipped can prevent large fire losses even during very adverse weather conditions, providing the crews can attack before fires gain too much headway.

In the area of forest-watershed land where the Division assumes direct fire control responsibility there occurred 3167 fires. However, that area was considerably enlarged during 1959, as will be noted in respect to "acres protected." The proper comparison upon equal areas would be 2492 fires in 1959 as against the annual average of 2218 during the previous ten years. This indicates that there was an increase of 12.3 percent in 1959.

The area burned in the total forest-watershed (Zones 1 and 2) protected by the Division in 1959 totaled 146,428 acres, but in the old zone it totaled only 135,094 acres. This latter figure is 5680 acres less than the ten-year average. Such an area loss constitutes a remarkable record on the part of the firefighters in view of the terrible potential for fire damage caused by the current and cumulative effects of adverse weather and the number of fire starts. That good record was scored in spite of 95 fires becoming larger than 300 acres. Experience has proved that once a fire reaches such a proportion its chance for becoming considerably larger is greatly increased, and that chance is more favored as the weather worsens.

The number of fires attended by Division forces (excepting mutual aid to other agencies), with the estimated damage caused, may be totaled as follows. It is to be noted, however, that the real but abstract values of watershed and recreation loss are not at all expressed in the damage figures below.

1959 Division of Forestry Fire Attendance

<u>Zone</u>	<u>Number of Fires</u>	<u>Estimated Damage</u>
Forest-watershed (Zone 1,2) area	3,167	\$ 3,012,055
Structural (Zone 1,2)	2,047	4,495,770
Zone 3 (see <u>County Activities</u>)	<u>6,074</u>	<u>6,886,352</u>
	11,288 fires	\$ 14,394,177

Of the 3167 forest-watershed fires listed above, 185 or 5.8% were caused by lightning. Of the 2982 man-caused fires the

principal reasons as to why, where, and how they occur should be of interest. Thirty-nine percent started in wild land as might be expected; 29% at roadside, and 7.5% beside railroads; only 3.3% in lumbering areas.

Travelers started 22% in addition to another 11% charged to railroads and vehicles; resident ranchers or tenants started 20%; children 14%. People in some form of recreation started 11.6% of which hunters were guilty of more than half. Tobacco-matches caused 37%; lumber slash and sawdust burning 1.48%; incendiary 10%; debris and land clearing escapes plus non-permit fires caused 17%.

In 1959 the secondary zone of watershed and rough rangeland protected by the Division was increased by a matter of 6,111,262 acres in Division-protected areas and by 1,219,033 acres in the Contract Counties. This extended zoning was recommended by the State Forester and duly approved by the Board of Forestry as provided by law.

A Few Words Regarding Statistics

The manner in which "non-urban" fire statistics are segregated is certain to be confusing to any person not acquainted with the several classifications of values protected and the agencies responsible for attacking fires and reporting upon them.

Years of common usage has caused the term "forest fire" to be related to any ground or vegetation fire burning in an uncontrolled state upon any wild land (not within the corporate limits of a city) and being within a zone designated as having some general public value for its timber growing capacity or watershed protection.

Statistics regarding forest fires are gathered and reported by cause, size, type and estimated value of vegetation burned. Statistics are grouped from two major sources as follows: those regarding fires which burned upon Federal land, including the National Forests, National Parks, Indian Reservations and public domain; and those fires burning upon privately owned land and land owned by the State and the counties.

Within the latter category, that is, the private-State "forest" land, that area having primary value from a timber and watershed standpoint is zoned and termed "Clark-McNary Land." Because this zone can be related to similarly designated lands for statistical purposes throughout the entire Nation, there has been prepared an item in this report titled Primary Timber Watershed; the Clarke-McNary Zone.

In California practically all of this primary zone of private-State forest-watershed land is protected by (a) the Division of Forestry; or (b) six counties having independent fire departments, and called for

convenience "Contract Counties" in this report, and being the counties of Los Angeles, Ventura, Santa Barbara, Kern, San Mateo, Marin; or (c) the U. S. Forest Service.

Also, there is a secondary zone of timber-watershed, private-State, land generally contiguous to the primary zone. Most of these lands are protected by the Division or the Contract Counties. These primary and secondary zones of "forest-watershed" lands are termed "State Responsibility Land" to indicate the fact of a public financial interest in their protection as declared by State law.

Outside of and beyond the "forest" fire category there are many fires burning upon agricultural, rural, desert or sub-urban types of land. Protection from such fires may be undertaken by the Division (if paid), by the Contract Counties, fire protection districts, or in any other manner determined by the local citizens. For convenience these are grouped as "rural" or Zone Three fires.

It is still to be noted that in addition to these "forest" and "rural" fires, many thousands of structural type fires, involving houses, vehicles and all man-made things, also occur each year throughout the entire State upon "forest" and "non-forest" areas, as well as within incorporated cities.

Primary Timber-Watershed; The Clarke-McNary Zone

In California there are 19,809,990 acres designated as land bearing or capable of bearing commercial timber or being primary watershed lands and being owned by the State or private parties (not within incorporated cities) for the protection of which the Federal Government contributes a proportionate share of cost. For the fiscal year 1960 that reimbursement contribution to California amounted to \$1,185,400 or approximately 9.2 percent of the qualifying expenditure for forest fire protection for the particular zone.

For the total "Clarke-McNary Zone" the following agencies give direct protection from fire to areas shown as follows:

Division of Forestry	13,412,600 acres
Forest Service	4,778,836 acres
Six "Contract Counties"	1,618,555 acres

In this primary forest-watershed area in 1959 there occurred 2473 fires which burned 127,473 acres (disregarding fires confined to structures and vehicles.) Regrettably statistical trends show no change for the better in this region. A downward trend in fire incidence during 1948-56 moved sharply upward each following year. Since a very few large fires account for most acreage burned, there is no meaningful trend in that annual history. For example, in 1959, 84 fires (3%) burned 87.3% of the total area burned.

Total Statistics for Gross "Forest-Watershed" Lands of California

1. Federal land ownership (acres)*

National Forests	20,360,396
National Parks	1,403,374
Indian	406,811
Public domain	1,762,848
Grazing districts (pub.dom.)	690,000
Misc.scattered	555,000
	<u>25,178,429</u>

2. State and private ownership (excl.incorp.cities)

Protected by:

Division of Forestry	25,928,435
6 Contract Counties**	4,336,076
U.S.F.S.	4,778,836
Nat. Park Service	3,784
Hoopa Indian Reservation	1,033
	<u>35,048,164</u>

TOTAL FOREST-WATERSHED LANDS: 60,226,593 acres

Totals of Fire Incidence on Land Areas

(a) Forest fires on federal land***

	<u>No. Fires</u>	<u>Acres burned</u>
National Forests	1797	184,274
National Parks	180	494
Indian Land	67	621
Pub. domain	103	16,853
Grazing districts	28	12,627
Misc. fed.	8	132
	<u>2183</u>	<u>215,001</u>

(b) Forest fires on State and private land
as reported by protecting agency.

<u>Agency</u>	<u>No. fires</u>	<u>Acres Burned</u>
Division	2920	112,126
6 Contract Counties	593	13,102
U.S.F.S.	517	42,078
Nat. Park Service	2	-
Hoopa Indian Reservation	6	3
	<u>4,038</u>	<u>167,309</u>

* Does not include military

** Bur.Land Mgmt. not inc. here

*** No structural or incorp. city fires included. It must be remembered that for strategic reasons and under formal agreement the Division and the Counties protect some of this federal land.

Forces in the Field to Combat Forest-Watershed Fires

The following brief listing of men, vehicles and other facilities is intended to convey the extent of preparation made in California each year to attack and extinguish fires originating upon what has been described as State Responsibility Land, that is, forest-watershed land of private or State ownership. It is to be noted that forces to protect Federal land and rural land are not represented here.

During the fire season the Division maintained for the protection of State Responsibility Land: 230 organized fire crews, 35 patrolmen, 82 lookout stations (of which 3 were manned by lookout-patrolmen), 50 bulldozer transport units. In addition to the 50 bulldozers ready to roll, there were 34 others assigned to Conservation Camps and available for fire duty.

Crew units varied in size among 5 standard crew complements selected to best serve the needs of the particular geographic area of assignment. In addition to the 230 Division crews, involving at full strength approximately 2,100 men, there were available for follow-up dispatch to any fire line from the 18 Conservation Camps some 1,400 inmates and wards. *

The Division operated (exclusive of those in the rural (Schedule A) zone) 456 water-carrying and pumping vehicles, of which 175 were four-wheel drive trucks. For all purposes the Division operated 142 sedans, 202 pickups, 61 jeeps, 242 station wagon and stakeside types, and about 100 miscellaneous vehicles, some of which were developed by Division equipment men for special fire line functions. In 1959 the Division added 6 house trailers and 24 buses to its fleet, principally for the conduct of Conservation Camp work.



*By pre-arrangement selected inmate crews may be taken directly from prison institutions (and from county jails if the respective supervisors so approve) for work during extreme fire emergencies. It can be reported without qualification that such a program has been conducted with success in California.

The six Contract Counties made the estimate of their respective forces available for forest-watershed fire protection during 1959 as listed below. It must be remembered that rural and structural fire protection needs and solutions are so naturally integrated with mountain fire protection within most of these agencies that it is not easy to make any segregation of facilities. And of more importance, this means that a very considerable reserve strength in the shape of rural fire protection facilities has not been reflected in the following table:

Los Angeles County Fire Department: 151 field and office supervisors, 260 firemen; 44 clerks and dispatchers, 16 specialists (law enforcement, etc.,) 7 lookouts and patrols; 78 miscellaneous, 300 juvenile wards in camps; 84 pumper trucks, 4 bulldozers, 49 stakesides.

Ventura County Fire Department: 13 field and office supervisors, 27 firemen, 2 clerk dispatchers, 2 lookouts, 2 specialists, 4 heavy equipment operators, 300 court wards and inmates on call; 13 pumper trucks, 4 bulldozers, 9 miscellaneous vehicles.

Santa Barbara County Fire Department: 16 supervisors, 31 firemen, 4 specialists, 25 on-call volunteers; 16 pumpers, 2 bulldozers.

Kern County Fire Department: 21 field and office supervisors, 23 firemen, 3 lookouts, 3 specialists, 100 county and local State institution inmates on call; 19 pumper trucks, 5 bulldozers, 5 stakesides.

San Mateo County Fire Department: 6 supervisory staff, 29 firemen, 7 clerks and specialists; 15 pumpers, 2 bulldozers, 5 stakesides, etc.

Marin County Fire Department: 6 supervisors, 37 wardens and firemen, 2 dispatchers, 2 lookouts, 5 equipment maintenance men; 19 pumpers, 1 bulldozer, 6 tank trucks, 9 jeeps and pickups.

With an allotment of nearly a million dollars of State funds for the protection of some 5.2 million acres of State and private land intermingled or adjacent to National Forests, the Forest Service maintains, as agreed upon, 50 fire crews, 19 lookout stations and 9 patrolmen.

In order to complete the picture of planned fire suppression forces in actual being throughout the privately owned forest and watershed lands of California during the summer months one would have to add to the above specific listings a very substantial contribution made by other agencies and persons.

These would include the men, vehicles, tools, communication and water systems, and so forth, provided by National and State Parks

and some of the Indian Reservations. Also credit must be given to a number of legally organized fire protection districts and incorporated cities which in the normal course of a summer often have reason to engage heavily in genuine forest fire suppression work within and adjacent to their boundaries.

Military services often contribute to forest fire control. In 1959 the Division received an estimated 5,200 contributed man-hours of such labor on going fires. And the Office of Civilian Defense is also to be cited in view of the many fire trucks which that agency has distributed among fire departments throughout the State.

The sum total of fire prevention and fire suppression effort expended by lumber companies is very important, and has been for half a century. Operating companies have prepared fire plans and designated fire bosses, and crews. Tool supplies set aside solely for fire use.

Railroads, public utilities and many other industries including agriculture make careful and specific pre-fire season plans. The fact that the work of such organizations is not set forth in this report should not detract from the total importance.

Rural Fire Protection by the Division

The Division assumes direct responsibility for supervising forest fire protection in all or portions of 48 counties. Twenty-four of these have asked the Division to furnish structural and agricultural fire protection service which would not otherwise be assumed by the State. Such a contractual arrangement grew up quite naturally during some 40 years of close cooperative effort between the State Forester and the several boards of supervisors.

The size of this rural (Schedule A) zone protected by the State is relatively unimportant since inflammable value is of primary concern in the matter of fire protection. Nevertheless, the area involved does cover nearly 7 million acres of rural, or sub-urban land. During 1959 the Division responded to 6074 fires in this zone. During the summer the Division operated 265 firetrucks and similar vehicles (most of which were owned by the respective counties), and in the winter season, 32 firetruck stations were added.

At Squaw Valley Olympic Village, including some 5000 surrounding mountain acres, the Division was reimbursed by the Olympic Commission in the sum of \$83,873 during 1959 for fire protection service. One fire extinguished in an expensive dormitory certainly justified that precautionary measure.

DIVISION OF FORESTRY BUDGET
Fiscal Year 1959-60

(1) General Support	\$ 18,120,129
(2) For other agencies protecting State and private State Responsibility Land.	2,240,198
(3) Emergency Fire Fund	1,019,450
(4) Blister Rust Control	94,600
(5) Insect Control	20,000
(6) Forestry and Fire Research	<u>263,045</u>
(7)	\$ 21,757,422
(8) Capital Outlay	\$ 4,670,009

Explanation of budget:

- (1) 2½ million increase over prior year due mainly to salary increases and added conservation camps.
- (2) To Kern, \$315,902; Los Angeles, \$425,626; Marin, \$100,407; San Mateo, \$98,224; Santa Barbara, \$151,599; Ventura, \$156,262; U.S.F.S., \$992,178.
- (3) Nearly double prior f.y. because of extended winter fire season. Expendable only for special emergency fire needs such as pick-up labor and air attack on campaign fires. (This item augmented above Governor's Budget).
- (4) Paid to U.S.F.S. in matching expenditures for field projects.
- (5) To be expended in approved cooperative abatement projects in areas of serious infestation.
- (6) See "Research Program" in this report. Includes \$111,045 soil-vegetation mapping.
- (7) Includes federal aid paid into State Treasury of \$1,236,040. Also includes \$351,649 reimbursement from U.S.D.I. for protection of scattered public domain of some 3.6 million acres. Does not include over \$2 million reimbursement by 24 counties for rural-structural protection. Does not include \$716,850 paid into General Fund as income from nurseries and State Forest products.
- (8) Fund expendable during 3-year period. Includes \$3,887,252 earmarked for conservation camp construction.

DIVISION OF FORESTRY EMPLOYEES
1959

General Groups of Regular Employees

State Forester, and Deputies	14
Assistant Deputy State Foresters	12
Rangers and Associates	111
Assistant Rangers	169
Trainees	12
Forest Technician classes	51
Law Enforcement and Education	10
Surveyor classes	18
Craftsmen and Mechanics	33
Storekeepers	7
Conservation Camp Supervisors and Foremen	231
Supervising Clerks, Stenos, Draftsmen, Dispatchers	161
Firefighter Foremen	396
Fire Truck Drivers and Operators	367
Cooks (year-long)	28
Regular Division Employees	1,620

State Employees on "rural" fire protection
work under contract.

Associate Rangers	5
Assistant Rangers	28
Foremen	61
Clerks	18
Drivers	203

Squaw Valley Olympic Area

Associate Ranger	1
Assistant Ranger	1
Foreman	3
Drivers	5
State Employees on Contract Service	325

Full-time Division Employees 1,945

Seasonal

Lookouts (seasonal)	119
Firefighters (seasonal)	1,178
Cooks (Seasonal)	178

1,475

GRAND TOTAL - DIVISION OF FORESTRY EMPLOYEES 3,410

Use of Aircraft

During 1959 the Division spent nearly \$400,000 for aircraft used in some manner for fire detection or control. An earmarked \$133,000 went into the so-called initial attack air program.

After the experience of the previous fire season it was clearly recognized that the economic and technical efficiency of this aircraft fire suppression attack system was still questionable. It was therefore decided to regard the 1959 effort as even more of an investigation than the previous work had been.

Contracts were awarded for the services of 7 airtankers and 6 observation ("dropco"-drop coordinating) planes to operate within three districts as dispatched. On a total of 143 fires there was dropped 380,000 gallons of borate solution and 123,000 gallons of bentonite mix.

The dropco planes directed operations by radio from the air and took moving pictures of the activity. Ground observers also prepared observation records for statistical analysis.

It has been determined that initial attack from the air was effective on 71 percent of fires, ineffective on 9 percent, not needed on 20 percent. These statistics have been further refined in respect to the control status of the fire when airdrops were made. It should also be mentioned that the "not needed" category was deliberately emphasized as a subject of special study this season.

Regular aerial patrols were conducted as usual in four regions. In the Humboldt and Mendocino redwood patrols the State provided two observers for each patrol, and a considerable sum for special flights in bad weather. Lumber companies contributed about \$16,000 for these two patrols, as against the State's \$17,000.

A patrol along the west side of the lower San Joaquin Valley and another flight looping around the Mt. Hamilton Range (Santa Clara) constitute two summer patrols established in the place of several fixed observation stations which would be more costly and presumably less effective.

In addition to the initial attack and patrol flights described, the State expended about \$241,000 statewide from the Emergency Fund as required for additional fire reconnaissance and detection patrols, transport of crews and overhead, additional air attack including rental of mixing equipment and purchase of chemicals.

For at least a decade well intentioned friends and adamant advisors have been telling the Division how to solve the serious forest fire problem from the air. The Division believes that it has not neglected its responsibility to investigate new methods while at the same time it

respects the attitude of the Senate Fact Finding Committee on Natural Resources when it declares, "...the air tanker program offers such a high ultimate cost potential that every effort should be made to assess its true value."

Emergency Planting on Burned Watersheds

The State Forester is authorized by law to engage in cooperative projects intended to preserve important watersheds or to prevent erosion and flood damage after serious fires. The present approach to such preventive work is by broadcast seeding soon enough after the fire to take advantage of the earliest rain.

Such work is relatively expensive and the results must always be uncertain since they rest upon the whims of nature. Therefore, emergency revegetation work of this type can be justified only where the potential damage is obviously great and, of course, where other parties are willing to accept approximately an equal share of the cost.

Much less emergency seeding was done in 1959 than during the previous year. Of 19,486 acres treated throughout California, the Division was involved in 7 projects and a total of 3421 acres, for which it expended \$3,110. Rye seed is the most popular material used, sometimes mixed with mustard and Blando brome. Incidentally, it is stipulated in contracts that early grazing must be prohibited on treated areas.

Seeding burned watershed by helicopter on 1959 burn in Monterey County



Range Improvement

In 1945 the Legislature authorized the Division of Forestry to engage in experimentation and improvement of foothill livestock ranges essentially because fire has long been used as an important tool to remove brush and other low value vegetation or to change its composition. That is to say, the place of the Division in range improvement was primarily related to the use of fire.



The Division is also required by law to advise and guide rangeland owners, and to issue permits which include recommendations regarding how to burn safely.

In each of the six administrative districts of the Division at least one forester trained in range management spends full time engaging in local investigation projects, in training Division field personnel in the administrative aspects of this particular work, and in consulting with ranchers.

During 1959 the Division issued permits to 330 individuals who completed 270 controlled burns. Of these burns, 25 were cooperative projects involving 2 or more ranchers. A total of 83,079 acres were burned under permit during the year. An additional 2,405 acres were burned by fire that escaped control. Approximately 30,000 acres of the planned burns were conducted upon recently burned land in an effort to control sprouting. Ranchers seeded over 28,000 acres, an area equal to 34 percent of the area burned under permit.

Range studies are being conducted in each of the geographic regions of the State to advance our knowledge of some particular aspect of mountain range management. Generally these studies are undertaken cooperatively by the Division with agricultural specialists and the owners of the land.

Upper photo: Division specialist and rancher study proposed burn

Lower photo: Conference of ranchers and Division technicians



Conservation Camps

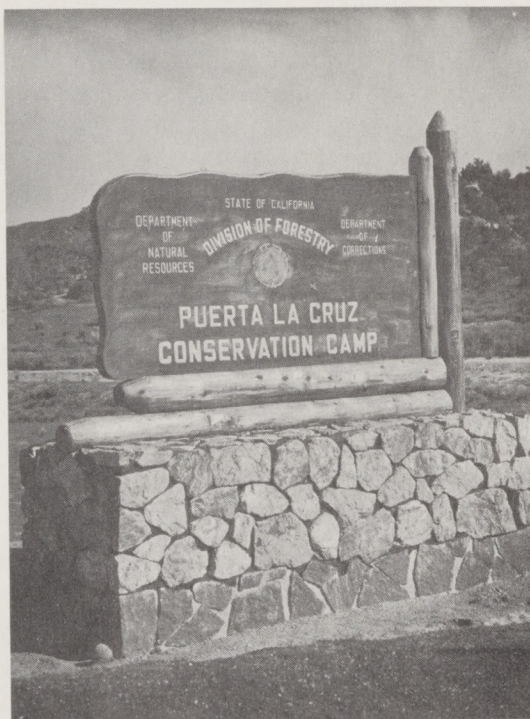
For 15 years the Division of Forestry has engaged in a cooperative work camp program with the Youth Authority and the Department of Corrections. Under this camp program prison inmates and youthful wards of the State are housed and worked at various projects in the field of wild land conservation. Custodian responsibility for the camp population remains with the designated authority, while camp construction and work supervision is handled by forestry personnel. The program has been eminently successful.

Because of Governor Brown's great personal interest in this project, and the hearty endorsement of the Legislature, the program was materially expanded in 1959. Five new permanent camps were established.

At the end of 1959, the Division supervised work projects in 18 inmate camps housing 1594 men, and three primary and 3 subsidiary ward camps housing 265 boys, providing a total of 1859 conservation camp residents. This constituted an 80 percent camp population increase over the previous year.

The camp workers perform body maintenance on Division motor equipment, fabricate and repair wooden and metal tools, furniture and so forth, construct and repair forestry roads, firebreaks, telephone and power lines, maintain forest nurseries and aid in various aspects of reforestation and research projects. For other State agencies, under contract, such work as fish and game preservation and culture, park improvement, and similar jobs of a direct public benefit are performed by the camp workers. These projects occupied some 2.33 million man-hours of conservation camp work during 1959.

The most obvious public value derived from this camp program, aside from the very real but abstract value of human rehabilitation, is the assistance rendered in forest fire suppression. During 1959 some 642,770 hours were contributed toward such work. The total work contribution from camps under Division of Forestry work supervision during 1959 was, therefore, practically 3 million man-hours.



Research Program

Throughout its entire history the California State forestry agency, which may most consistently be referred to as the Board of Forestry during three-quarters of a century, has repeatedly been an important contributor to numerous very practical research projects within its field. Sometimes the contribution has been by way of a complete or partial payment for the services of experts to undertake specific projects. Very often, however, State forestry employees have entered into phases of the actual research, and especially those phases conducted out on the ground where the regular forces and facilities of the organization could be brought into play.

The Board and Division has been well aware in recent years of the potential value of advanced techniques in science and industry which might be applied to fire control and other forestry problems. In order to proceed in an orderly manner and to gain support in obtaining necessary funds, the Board of Forestry sponsored a Wildland Research Planning Committee.

The widely representative advisory committee recommended numerous specific subjects requiring investigation and the priority of importance as judged by the committee as well as a proposed budget for research.

The Board adopted the committee's plan in 1958 and established it as a guide for future research activity. The situation was described in a neat State publication titled Wildland Research Plan for California. In 1959 a Supplement to the basic document was printed after its cooperative compilation by the Division, the University and the Pacific Southwest Forest and Range Experiment Station.

During 1959 the Advisory Committee on Forestry Research, which had been created by the Board of Forestry in 1958, held two meetings to review progress and make recommendations. The committee consists of 10 citizens representing private industry in the entire spectrum of forestry interests including those of an agricultural nature. The committee recommended 11 additional research projects with a proposed total State budget of \$292,000. State administrative officials deemed it proper to limit the proposal to four new projects and a \$200,000 budget. The new studies will consider the development of new fire control equipment, forest rodents, dwarfmistletoe, and the "X" disease in Southern California pine species.

During 1959 twelve cooperative research projects were undertaken in which other agencies than the Division played a material part, sometimes to the extent of conducting all of the work for a specified reimbursement of expenditures. Not included below is the wildland vegetation survey which is mentioned elsewhere in this report. Only a slight attempt is made here to explain the object of the research.

For the record, however, the 1959 research projects, their budgeted cost and cooperator are listed. The letters PSWFRES refer to Pacific Southwest Forest & Range Experiment Station with headquarters at Berkeley; UC refers to University of California.

<u>Project</u>	<u>Budget</u>	<u>Contractor</u>
Fire Protection Economics how much limit, and in what manner should money be spent on fire suppression	\$ 13,250	UC
Fire Prevention why do people start fires; how to reach them by law or educa- tion.	6,000	U of So.Cal and PSWFRES
Lightning Control by chemical nucleation; direction of work and analysis of Division field effort to be done by coop- erator.	28,000	PSWFRES
Fire Climate what causes abrupt local weather changes during fires	20,000	PSWFRES
Fuel Break what methods to eliminate or treat heavy brush fuels to re- duce fire suppression task? A widely cooperative project.	14,000	PSWFRES
Forest Growth Prediction how much annual commercial yield can be expected in various timber types?	9,000	UC
Seed Tree Effectiveness what natural regeneration follows with known seed and site conditions?	9,000	UC
California Hardwoods how to process hardwoods for econ- omic use.	5,500	UC
Planting Stock Physiology what can be done between germination and planting of nursery stock to ef- fect greater success in artificial regeneration	10,000	UC

Bark Beetles what are the vulnerable aspects in the body and habits of insects that will lead to their destruction?	6,250	UC
Herbaceous Interception of rainfall and the resultant water loss to man.	7,000	PSWFRES
Watershed Research at San Dimas upon and under brush watersheds.	24,000	PSWFRES
	<u>\$ 152,000</u>	

(a listing of a few publications involving this research is made under Publications at the end of this report.)

Education

During 1959 the Division Training Centers at Sutter Hill and Ramona received and graduated after intensive five-week courses a total of 40 Foremen and 220 Drivers. The installation of a fire laboratory for practical classroom demonstrations at Sutter Hill was of considerable added benefit in this valuable in-service Division training.

General public education has long been considered a primary goal which may never be adequately accomplished. This is primarily true in the field of fire prevention. Fortunately, the program is carried on with congenial cooperation by many interested parties and with valuable contributions from professionals in the advertising and entertainment world.

Simply by way of indicating the extent to which the Division of Forestry enters into this great cooperative project there follows the briefest listing of a few things done during 1959 by Division personnel: made 8432 contacts with the public press which included 2753 news releases; participated in 1276 radio presentations in addition to furnishing copy for 2464 announcements; distributed 1,900,000 pieces of printed material such as pamphlets and stickers; arranged 465 store window displays, 77 parade floats and 51 fair exhibits; posted 1565 large fire prevention highway signboards; presented about 2300 group programs with and without films; held 3187 training programs for over 21,000 citizens; made 58,000 personal contacts through patrolmen in addition to a half-million in office and other routine work; issued 112,065 regular permits to burn in addition to special types of permits; assisted in roadside hazard reduction along some 700 miles of roadway.

These listed accomplishments were aimed primarily at enlisting public aid in the prevention of fire, as mentioned above. Additionally,

a great deal of public education was accomplished by Service Foresters and other personnel in the field of forest harvesting, regeneration and protection from animals and disease.

Soil-Vegetation Survey

Since 1947 the Division has been participating in a soil-vegetation survey of the upland areas of California. This survey obtains accurate basic information on kinds and distribution of soils and associated natural vegetation, their relationships, and their characteristics and uses. Inventories of the soil and vegetation resources of foothill and mountainous wild lands are secured through this project. The information gained is of fundamental importance in better management of these lands for timber, forage, water, and other resources.

Prior to 1958 this survey was conducted cooperatively by the California Division of Forestry, the Pacific Southwest Forest and Range Experiment Station, and the University of California. In late 1958, the Soil Conservation Service became an active participant.

State participation is financed by an appropriation item to the Division of Forestry, which is currently \$111,045 annually. Field mapping, cartographic services, and laboratory work are performed by the Forest and Range Experiment Station and the University under contract with the Division. Five soil-vegetation mappers, in two field crews, and the necessary cartographic and supervisory personnel carry on the work program.

During 1959 field mapping was completed on a total of 336,000 acres of which 173,000 acres were in Humboldt County, and 163,000 acres in Shasta. An additional 63,000 acres in Shasta County was completed by SCS personnel. Quadrangle maps showing 459,000 acres of soil-vegetation data were drafted during the year.

Service Forestry

In California over a third of the 8 million acres of private forest land is owned by tens of thousands of farmers, businessmen, absentee owners and the like. Many of these people do not understand the principles of good forest management. The Division's service foresters are employed to meet with these owners on request and to consult with the owners on methods of harvesting and marketing forest crops, preparation of management plans, protection for the forest from insects, disease and fire and improving forest production by judicious land management practices. It is vital to the State that this large land area be kept in profitable forest production. The Federal government also cooperates in the program under the Cooperative Forest Management Act of 1950.

During 1959 over 1,500 requests for service were received. Nearly 1,000 owners of 214,374 acres of forest land were given management assis-

tance. Improved practices were used in the harvesting of 71 million board feet of timber. Marketing advice was given owners in the sale and harvest of another 22 million board feet. Owners of nearly 40,000 acres of land were advised and encouraged to obtain the services of private consulting foresters. This is done when large ownerships are involved or where there are prospects for prompt and considerable profit. Following the advice of the State service foresters landowners planted 1,951 acres, pruned 1,735 acres of young timber, and cut 2,823 acres to improve the timber stand. An additional 28,800 acres of timber were saved from premature harvest through the advice of the service foresters.

In 1959 the Division employed 10 service foresters. They are located in Fortuna, Willits, Santa Rosa, Redding, Oroville, Sacramento, Camino, Fresno, Monterey, and Riverside. Their accomplishments contribute substantially to the goal of good forest management on the private forested lands of California.

Small Watersheds

By provision of U. S. Public Law 566, commonly called the Small Watersheds Act, the Division is a cooperating party in respect to special forestry aspects of building small dams and improving water production wherever this law is applied. Thus far, 47 applications to proceed with cooperative projects in California are on file and 21 more are in process. Of these, 25 ground plans have been completed. The principal interest of the Division as a cooperator is in furnishing increased fire protection where recommended. Only six of these dam-building projects were thus far deemed in need of additional fire protection, but the added cost from all agencies is estimated at the not inconsiderable sum of 1.6 million dollars.

Forest Taxation

The State Constitution provides that timber on cut-over lands is exempt from taxation for 40 years and until such time as it is officially declared mature.

Accelerated cutting of young-growth timber in the early 1950's in the north coast region prompted action to have such stands declared mature for assessment purposes. Properties were investigated in Humboldt County in 1955, Mendocino in 1957 and Sonoma in 1959. Criteria for determination of maturity are set forth in policies of the State Board of Forestry. Properties are examined by representatives of the local Assessor and the Board of Equalization with a forester from the Division. Then a member of the Board of Forestry meets with the County Assessor and the Board of Equalization representative to formally act on declaration of maturity of the examined properties.

In 1959, there were 43 properties having an area of 18,817 acres of timber that were declared mature for assessment purposes in three counties. The cumulative total to date embraces 179 properties involving 121,860 acres.

Forest Pests

Forest insects, disease and animals destroy and injure more merchantable timber than does fire. They are very difficult to abate or eliminate, however, because so much of their destructive work occurs over widespread areas and is rarely spectacular enough to excite a demand for concentrated action. It might be added that lack of biological knowledge is often a severe handicap in establishing methods of control.

In California a broadly representative Pest Control Action Council cooperates in gathering data and recommending control activities. To this Council the Division made a report during the year of 158 new areas of pest attacks.

Tree beetles were especially active during 1959 (except in the North Coast) attacking pine, Douglas fir and the true firs. At a cost of \$24,252 the Division participated directly in six insect control projects, wherein the State bore no more than half the cost.

Division personnel acted as aerial and ground observers in the serious work of detection and reporting, a cooperative project. Also cooperatively the Division worked in several research projects, including methods to control dwarfmistletoe, blister rust, rodents and deer damage. It should also be noted that the Council recommends more attention to the reduction of porcupine population because of that animal's habit of deforming pine trees by eating the tops.

White pine blister rust is so firmly established in California that it can be hoped to save and utilize only the most thrifty and valuable sugar pine. On State-owned property the Division, largely through the effort of Conservation Camp crews, treated some 711 acres by eradicating host plants. On nearly 15,000 acres of private land the State aided with work and money contributions approximating half the cost of such work. Division personnel discovered blister rust as far south as central Mendocino County during 1959.

Immediate salvage-logging after disastrous 1959 fire in El Dorado Co. to prevent insect epidemic

PSWFRES photo



Nurseries and Planting

The Division maintains forest nurseries near Davis and at the following Conservation Camp sites: Parlin Fork (Mendocino Co.) Magalia (Butte), and Ben Lomond (Santa Cruz).

During the 1958-59 active season these nurseries distributed 3,060,000 trees valued at nearly \$43,000. This distribution was less than that of the prior year because of a shortage of Douglas fir seedlings and a delay in planting due to unusual drought.

Field crews collected and sent to Davis processing plant more than 2000 sacks of cones. The yield of seed, though valued at more than \$16,000, was generally poor because of heavy insect infestations in cones and seeds.

Reforestation studies were conducted on four State Forests in which 22,100 trees were planted for future close scrutiny. On other areas some 25,800 trees were furnished and planted to obtain information on methods of planting, rodent control, vegetative competition, survival and similar problems.

Of the planting stock distributed by the Division nurseries last season approximately 7 percent was for public grounds and roadside planting, 25 percent for reforestation of public forests, the remainder for qualified forestry purposes on private land.



PARLIN FORK NURSERY



Using seed-gun to sow tree seed in Calaveras reforestation study. Note screens above seed to exclude rodents.

State Forests

Forty years ago there was a concerted Board of Forestry effort, endorsed by the lumber industry, for the acquisition by the State of cut-over forest lands to be held and improved as State Forests. Nothing came of that proposal. At the close of the Second World War, there was purchased in accordance with legislative approval and appropriation, some 69,000 acres of representative pine and redwood lands in four units to be managed perpetually as State Forests. At this time it was becoming quite evident that the harvesting demand upon California's timberland was going to increase rapidly and continue indefinitely. These acquisitions, with four small grants involving 1188 acres, make up the State Forest system of California. It must be remembered, of course, that a very great area of the State had long been set aside as National Forests.

The establishment of State Forests assures such advantages to the public welfare as the replenishment of timber, watershed and wildlife protection, and public recreation. But a primary value of these public lands is expected to result from investigations and intensive studies in respect to management and silvicultural processes conducted upon the Forests by Division personnel and interested cooperators. Thirteen individual investigations of this sort were in process during 1959 on the State Forests. Naturally, some of them require the passage of years to be fully completed.

The planned conversion of old growth timber to managed young growth permitted the sale of over 27 million board feet of stumpage in six large sales. Combined with 100 small sales of

Harvesting experiment in young-growth redwood-Douglas fir in Jackson State Forest to determine best management methods



salvage logs, Christmas trees, firewood, posts, etc., the State realized an income of \$676,450 in 1959. Since such sales were first authorized and begun in 1946, there has been paid into the State General Fund a total of nearly 3.5 million dollars as income from State Forests. In addition there has been a considerable contribution of forest products utilized by the Division for its own construction projects.

State law provides that the recently acquired State Forests shall pay to the respective counties in which they are situated annual sums equivalent to local property taxes. From 1947 to 1960 the State has paid out \$292,340 in such lieu taxes for the support of local government.

Forest Practice Act

There was great activity during 1959 in the direction of modifying forest practice rules through public hearings before the duly appointed Forest Practice Committees. The Board of Forestry was much occupied in hearing and approving proposed district rule changes and also in hearing appeals to approve alternate plans of conducting timber operations as proposed by individual operators.

During this year Division field inspectors, as directed by the Board of Forestry, concentrated upon stricter investigations and reporting of compliance and non-compliance with laws and rules in timber operations. In total 2279 inspections were conducted.

In 1959 there were 2060 permits extant for the purpose of operating commercial timber harvesting. Under these permits, which are issued by the State Forester, there were 1677 active operators who will produce nearly 6 billion board feet of timber products.

In conformance with law, 148 owners filed affidavits with the Division explaining their intent to convert a total of 87,420 acres of timberland to other uses. The great majority (96 percent) is intended for grazing, while 2 percent is to be developed as urban property.

PUBLICATIONS OF 1959

(by, or in cooperation with, the Division)

California Government and Forestry, by C. R. Clar; 623 pp,
(State Printing Office)

Wildland Research Plan (a supplement to Wildland Research in California), (S.P.O.)

Suggested Safety Guides for Controlled Burning (4 x 6 inches)
12 pp (S.P.O.)

"Planned Burning as a Management Practice for California Wild Lands" by L. T. Burcham, 21 pp, Multilith, C.D.F.

"Improving Brush-covered Lands Vital to the State" by L. T. Burcham, in Cal. Range News, Oct.10, 1959.

"State Forester's 1958 Report," multilith C.D.F.

"Production of California Timber Operators in 1957," (Jan.1959)
9 pp, multilith, C.D.F.

"Activity in Range Improvement - Annual Report, 1958"
11 pp, multilith, C. D. F.

"Emergency Revegetation of Burned Watersheds - Annual Report, 1958," 11 pp, multilith, C.D.F.

"Forest Pest Conditions in California, 1958" 29 pp, multilith, C.D.F.

"Christmas Tree Utilization Study" 1959, 2 pp, multilith, C.D.F.

COOPERATIVE PUBLICATIONS involving a financial contribution on the part of the Division

** By Pacific Southwest Forest and Range Experiment Station:

"Mountain Evaporation" (Misc.Paper No. 35)

"Mountain Temperatures" (Misc.Paper No. 36)

"Four Hundred Sixty Storms" (Misc.Paper No. 37)

"Nuclear Probe Compared with Other Soil Moisture Measurement Methods" (Forest Research Notes No. 146)

"Preliminary Tests on Some New Fire Retardants" (Forest Research Notes No. 140) and

"Using Swelling Bentonite Clay as a Fire Retardant"
Phillips and Miller, 11 pp.

**By the University of California, published in California Forestry
and Forest Products:

"Kiln Drying 4/4 California Black Oak," Nov. 1959

"Kiln Drying 4/4 Pacific Madrone," Oct. 1959

"Drying Stress Patterns in California Black Oak," Jan. 1959

"Strength and Related Properties of Pacific Madrone," Dec. 1957

"Strength and Related Properties of California Black Oak," May 1958

"Strength and Related Properties of California Tanoak," Sept. 1958

** By the University of California in other outlets than above

"Collapse in Wood - Exploratory Experiments in Prevention,"
Forest Products Journal, Jan. 1960

"Mechanical Properties of California Grown Monterey Pine,"
Hilgardia

"Ponderosa Pine Planting Stock," California Agriculture, March 1959

"Root Regeneration of Ponderosa Pine Seedlings Lifted at
Different Times of Year," Forest Science, Dec. 1959

(See also mimeo reports of the Senate Fact Finding Committee
on Natural Resources.)



